U.S. Department of Energy Office of Safety and Emergency Management Evaluations Criteria Review and Approach Document	Subject: Occupational Radiation Protection Program Inspection Criteria, Approach, and Lines of Inquiry Acting Director, Office of Safety and Emergency Management Evaluations Date: 12/4/12 Criteria Lead, Occupational Radiation Protection Program Date: 12/4/12	HS: HSS CRAD 45-35 Rev: 1 Eff. Date: December 4, 2012 Page 1 of 7

1.0 PURPOSE

Within the Office of Health, Safety and Security, the Office of Enforcement and Oversight, Office of Safety and Emergency Management Evaluations' mission is to assess the performance of environment, safety, health and emergency management systems (Integrated Safety Management); programs (Worker Safety and Health Program); and practices in protecting our workers, the public, and the environment from the hazards associated with Department of Energy (DOE) activities and sites.

The focus of this Criteria Review and Approach Document (CRAD) is on observing work activities to determine if implementation of systems, programs, and practices result in application of adequate controls to protect against the associated hazards. Where deficiencies are identified, systems, programs, and practices are reviewed to identify if systemic weaknesses are present. This CRAD also includes engagement of workers and their site union representatives with regard to involvement in work planning and safety rights.

A key to success is the rigor and comprehensiveness of our process; and, as with any process, we continually strive to improve and provide additional value and insight to field operations. Integral to this is our commitment to enhance our program. Therefore, we have revised our Inspection Criteria, Approach, and Lines of Inquiry for internal use and also we are making them available for use by DOE line and contractor assessment personnel in developing and implementing effective DOE oversight and contractor self-assessment and corrective action processes on this WEB page. The CRADs are available at http://www.hss.doe.gov/indepoversight/safety_emergencymgt/guidance.html

2.0 APPLICABILITY

The following Inspection Criteria document is approved for use by the Office of Safety and Emergency Management Evaluations.

3.0 FEEDBACK

Comments and suggestions for improvements on these Inspection Criteria, Approach, and Lines of Inquiry can be directed to the Acting Director of the Office of Safety and Emergency Management Evaluations on (301) 903-5392.

Occupational Radiation Protection Program
Inspection Criteria, Approach, and Lines of Inquiry

Introduction: This document provides an overview of the Criteria, Activities, and Lines of Inquiry that will be used to collect information to evaluate occupational radiation protection programs against DOE policy, standards, and regulatory requirements. The approach includes evaluation of essential programmatic elements of radiation protection programs with additional emphasis on implementation of the core functions of integrated safety management.

Inspection Activities: The following inspection activities apply to all functional areas and lines of inquiry shown below:

- Review radiation protection program plans, technical basis documentation, implementing procedures and records.
- Interview personnel including central and line radiation protection managers, staff, and subject matter experts.
- Review selected in progress work plans, procedures, permits and work activities associated with implementation of radiological protection requirements and core functions of Integrated Safety Management.
- Perform facility and building walkdowns and inspections.
- Observe selected work activities such as radiological surveys, monitoring, sampling, job coverage, training, and radiological support functions.

A. Radiation Protection Organization and Administration

Inspection Criteria: Radiation protection program design including organizational structure and administration are sufficient to provide for effective implementation and control of all radiological protection activities. (10 CFR 835.101)

Inspection Lines of Inquiry:

- Is there a documented Radiation Protection Program (RPP) that adequately addresses the flowdown of regulatory requirements including how each element of 10 CFR 835 is implemented?
- Are updates to the RPP submitted to DOE: whenever a change or addition to the RPP is made (if the change decreases the effectiveness of the RPP); prior to the initiation of a task not within the scope of the RPP; within 180 days of any modification to 10 CFR 835?
- Are the organizational responsibilities for radiological protection well defined and understood with staffing and resources sufficient to accomplish assigned tasks?
- Are radiological protection requirements actively administered by site/facility management and supervision and adhered to by personnel, and do managers and supervisors observe radiological protection activities to ensure adherence to established policies and procedures and to identify and correct problems?
- Are appropriate and effective internal and external audits scheduled and performed to determine the effectiveness of the radiological protection program to identify problems, root causes, and execute appropriate corrective actions?

- Do internal audits of the RPP ensure that all functional elements of the program are reviewed at least every 36 months?
- Are appropriate radiological protection performance indicators established and periodically assessed to enhance radiological protection effectiveness?
- Are radiological protection problems adequately documented and evaluated? Are evaluations properly reviewed for trends, and are actions taken to correct the causes?

B. Radiological Work Planning, Exposure, and Contamination Control

Inspection Criteria: Radiological work planning processes are formally defined, designed, and implemented in a manner that adequately defines work scopes, integrates with other safety and health disciplines, minimizes the potential for spread of contamination, and ensures radiological exposures to personnel are maintained as low as reasonably achievable (ALARA). (10 CFR 835.101)

Inspection Lines of Inquiry:

- Are written work authorizations such as radiological work permits or other technical work documents approved by the radiological control organization and used to control entry into and perform work in all radiological areas, and do these authorizations adequately specify the hazards and appropriate radiological control measures (i.e., radiological conditions, personal protective equipment (PPE), limiting conditions, hold points, void limits, etc)?
- Is work scope sufficiently defined and conveyed such that radiological controls are sufficiently tailored to the work being performed?
- Are radiological work authorizations followed as written?
- Are pre-job briefings used and effective in conveying radiological hazards and controls?
- Are workers appropriately trained and qualified prior to performing radiological work?
- Are there methods in place to integrate radiological work control processes with other site work planning and control processes to ensure synergy of controls for different hazards?
- Is the ALARA process formally defined and effectively used to evaluate and control all occupational exposures?
- Are appropriate radiological controls for both external and internal exposure evaluated and applied to radiological work?
- Is the appropriate hierarchy of controls effectively implemented including engineering and administrative controls, followed by PPE?
- Do Radiological Control Technicians (RCT's) provide effective radiological job coverage including surveys and sampling during work in radiological areas?
- Do workers use good work practices to prevent spread of contamination to their skin or personal clothing while handling radioactive material or while working in and exiting contaminated areas?
- Are postings and boundary controls adequate?
- During work with radiation sources and radioactive materials, are appropriate measures defined and implemented to prevent unintentional exposures and/or the spread of contamination to clean areas?

C. Radiological Surveys and Monitoring

Inspection Criteria: Adequate routine and non-routine radiological surveys and monitoring are performed for external radiation, fixed and removable contamination, and airborne radioactivity, as needed to characterize radiological conditions and ensure safety of personnel. (10 CFR 835.401; 10 CFR 835.403)

Inspection Lines of Inquiry:

- Is a documented radiation monitoring program in place that includes the frequency and location for routine and non-routine radiation and contamination surveys?
- Are there adequate procedures and criteria used to define radiological air sampling and monitoring needs and is appropriate air monitoring performed during activities with the potential for generating airborne radioactivity and/or when personnel are prescribed respiratory protection?
- Are there adequate procedures and criteria for completion of survey records, chain of custody for samples, acceptable radiation levels, evaluation of survey and sampling results, and for acting upon and/or reporting of off-standard survey results?
- Are radiological survey and monitoring records being effectively used to evaluate facility radiological hazards and conditions prior to the initiation of work activities?
- Are instruments used for surveys, sampling, and monitoring properly calibrated at an appropriate frequency, operationally tested before use, and properly maintained?

D. Radiological Postings, Access, and Material Controls

Inspection Criteria: Radiological postings, access controls, and material controls are sufficient to prevent unauthorized access and avoid unnecessary radiological exposures. (10 CFR 835.601; 10 CFR 835.602; 10 CFR 835.603)

Inspection Lines of Inquiry:

- Are there appropriate procedures and criteria used for defining radiological areas and associated posting requirements?
- Are signs used to post radiological areas and material clear and conspicuous?
- Are there appropriate procedures and criteria used for labeling radioactive materials including containers and process lines, ducts, vessels, etc.?
- Are there appropriate administrative and engineering controls in place to provide adequate access control for entry into radiological areas including necessary signs, barricades, lights, locks, and/or interlock systems?
- Are current radiological conditions and entry requirements to radiological areas adequately posted and/or readily available to workers?
- Are there appropriate procedures in place for radiological source and inventory control?

E. External and Internal Dosimetry

Inspection Criteria: Programs for external and internal dosimetry are designed to ensure personnel radiation exposures are accurately determined and recorded. (10 CFR 835, Subpart C, Standards for Internal and External Exposure)

Inspection Lines of Inquiry:

- Is the technical basis for external and internal dosimetry adequately documented and do the technical bases consider all applicable radiation types, energies, and exposure potential?
- Is the technical basis for air sampling and monitoring adequately documented, including types and frequency based on potential hazards, and is this basis adequately integrated with the internal dosimetry program?
- Is all technical basis information adequately flowed down and implemented through formal procedures?
- Do external dosimetry protocols and practices adequately account for potential whole body, skin, and extremity doses?
- Are there adequate methods in place for evaluating, controlling, and acting on potential internal exposures, including routine and/or special bioassay, air monitoring, respiratory protection, workplace indicators, and response procedures?
- Do bioassay and air monitoring protocols and practices provide methodologies to estimate unrecorded internal dose.
- Has the site effectively implemented changes needed for proper transition to the International Commission On Radiological Protection (ICRP) 60 dosimetric methodologies mandated by the 2007 amendment to 10 CFR 835, including possible need for recalculation of doses, changes to technical basis documents, development of new computer models, training of dosimetrists, or creation of new recordkeeping methods.

F. Radiological Training and Qualification

Inspection Criteria: Formal radiological training programs are in place and effective in developing and improving knowledge and skills necessary to perform assigned job functions (10 CFR 835.103)

Inspection Lines of Inquiry:

- Are there training programs established and implemented for both initial and continuing training of workers and radiological control personnel?
- Are formal job performance measures in place and used to evaluate the qualification of radiological workers and technicians prior to assignment to independently perform assigned tasks?
- Are radiological training and qualification records maintained and readily available to managers and first-line supervisors?
- Has each individual completed radiation safety training before being permitted unescorted access to controlled areas and before receiving an occupational dose at a DOE site or facility?
- Does radiation safety training include the following topics, to the extent appropriate to each individuals' prior training, work assignments, and degree to exposure to potential

radiological hazards: risks of radiation and radioactive materials, including prenatal radiation exposure; basic radiological fundamentals and radiation protection concepts; physical design features, administrative controls, limits, policies, procedures, alarms, and other measures implemented at the facility to manage doses and maintain doses ALARA, including both routine and emergency actions; individual rights and responsibilities as related to the implementation of the facility radiation protection program; individual responsibilities for implementing the ALARA measures required by the RPP; and individual exposure reports that may be requested?

G. Radiological Records

Inspection Criteria: Radiological records are maintained to demonstrate compliance with 10 CFR 835 and are easily retrievable, allow for appropriate trend analysis, and aid in the protection of personnel and control of radiation exposure. (10 CFR 835 Subpart H Records)

Inspection Lines of Inquiry:

- Does the radiological records management program in use effectively retain and allow for retrieval of all applicable radiological control documentation including radiological policy statements, manuals, procedures, personnel dosimetry, medical files, bioassay results, training records, ALARA reviews, meeting minutes, survey and monitoring results, radiological inventories, instrument calibrations, quality assurance tests, and other necessary records and reports?
- Have radiological control record-keeping standards been established with respect to completeness, accuracy, legibility, and modification, and are these records auditable and controlled through all stages of creation, distribution, use, arrangement, storage, retrieval, media conversion, and disposal?
- Have employee radiological work histories (i.e., occupational exposures received at DOE and non-DOE facilities) established and recorded on suitable forms?
- Are records of individual external and internal radiation doses being maintained in a manner that permits evaluation of compliance with dose limits, monitoring, and reporting requirements?
- Are other personnel radiological records such as incident or occurrence evaluations, formal declarations of pregnancy, results of medical examinations, and fit testing being properly maintained?